However, to prevent these timing signals from arriving outside the allowed operating range of delays of between 0 and 90 degrees, the output of amplifier **207** is used. This output is approximately 90 degrees later than the time reference. It is fed to amplifiers **219** and **220** and diodes **245** to abruptly expand the rising and falling voltages at about 90 degrees. This way the signal from amplifier **231** and its inverted value will not be able to reach points beyond 90 degrees. Thus no timing pulses beyond 90 degrees are possible.
The voltage divider, resistor **226**, and potentiometer, **228** , feeds a part of a DC reference voltage to the noninverting input of amplifier **231**. Another voltage divider feeds a part of the DC output voltage of the power supply to the inverting input of the amplifier **231.** This causes the amplifier **231** to react in such a direction as to try to maintain a desired output voltage as set by potentiometer **228.** Amplifier **231** can be overridden by the Current Limit Amplifier **120** in **Fig. 5** through a connecting diode **240**. If the current limit reference is exceeded then amplifier **120** overrides amplifier **231** and takes over the phase angle control and determines the current limit as desired.

Proper operation demands that the output of amplifier **231** be further limited in the negative direction by transistor **254** and in the positive direction by transistor **238**. The negative limit serves to clear tolerances in the exact beginning of the waveform from amplifier **235**. The limit imposed by transistor **238** is approximately proportional to the mains voltage. It is derived from an unregulated point of an auxiliary voltage, typically about 20 V DC.. Experience from models has shown that without this precaution abnormally low mains voltages, such as brown outs, could cause high spikes from the leakage inductance that could destroy the mosfets.